

on the down grade from the filling station by an attendant, while the dumping and returning of the empty car is automatically performed.

The full car descends the gradient against the action of a counterweight, shown in fig. i, which is connected to the car by a flexible steel cable running over a system of guide pulleys. When the car reaches the bunkers over the boilers it is emptied by the automatic opening of the car sides, and the action of the counterweight then returns the car to the filling station. At the filling station a coal-receiving hopper is preferably provided, from which the coal is filled into the automatic coal car. If desired, the weight of the coal in each car can be weighed and automatically recorded. An automatic railway such as described can make fifty trips per hour, and thus deal with 50 tons per hour, when equipped with a 1-ton car, or 100 tons per hour with a 2-ton car.

The two systems of railways referred to above can, however, only be used in those instances where the arrangement of the plant and the site is suitable.

Generally it is found that the railway siding level coincides with the level of the power station yard, and in these cases it is necessary to use some system of elevators and conveyors to lift the coal from coal-receiving hoppers below ground level into the coal bunkers over the boilers.

The main types of elevators and conveyors so used are as follows:

1. The Gravity Bucket Conveyor for lifting and distributing the coal to the bunkers.
2. The Bucket Chain Elevator for lifting the coal, combined with either a tray or a belt conveyor, for distributing it to the bunkers.
3. Belt Conveyors throughout.

These are described in Chapter II.

CHAPTER II

Coal Handling Apparatus

The Gravity Bucket Conveyor.—This conveyor consists of an endless chain of tipping buckets linked together by chains of special con-

struction. The whole system is balanced so that the work of driving the complete mechanism round is simply the power required to overcome the friction of the loaded chain of buckets, plus the work done in lifting the coal from the point at which it is fed into the buckets to the height required.

A typical arrangement of power station, with a gravity bucket coal elevator, is shown in fig. 3, in which the coal is dropped from railway wagons into a coal-receiving hopper A, whence the small coal passes through a jigging screen B (which also regulates the feed of coal from the hopper), while the larger pieces which pass over the screen are broken to the required size in a roll type breaker c. After passing the screen and the breaker the